UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/635,959	08/07/2003	Satoshi Seo	0553-0377	1217

7590 06/14/2005

COOK, ALEX, McFARRON, MANZO
CUMMINGS & MEHLER, LTD.
SUITE 2850
200 WEST ADAMS STREET
CHICAGO, IL 60606

EXAMINER	
GUHARAY, KARABI	
ART UNIT	**PAPER NUMBER**
2879	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/635,959	SEO ET AL.
	Examiner	Art Unit
	Karabi Guharay	2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-72 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-72 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 07 August 2003 is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 08/07/2003.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

Figure 4A should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 25-36 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 13-24 respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 52-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 52-53 recite the limitation "the hole blocking material". There are insufficient antecedent basis for these limitations in the claims.

Claims 45,57,69 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Each of claims 45, 57 & 69 recites that floating electrode comprises an insulating film formed contacted with EL film, however, floating electrode lies between electron transport supporting layer and an electron transporting layer, so it is not clear how insulating film of the floating electrode will contact the EL layer.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 49-51, 54, 58-60 are rejected under 35 U.S.C. 102(e) as being anticipated by Hung (US 6483236).

Regarding claim 49, Hung discloses an electroluminescent element an EL element (organic light emitting device, Fig 2) comprising a cathode (250, lines 26-28 of column 4), an electron transport supporting layer (240, lines 25-26 of column 4) over the cathode, a floating electrode (234, made of aluminum) over the electron transport supporting layer, an electron transporting layer (232, made of electron transporting material LiF, lines 14-24 of column 4) over the floating electrode (234), an electroluminescent film (210, 220, lines 3-13 of column 4) containing an organic compound capable of generating electroluminescence over electron transporting layer (232) and an anode (204, lines 1-2 of column 4) over the electroluminescent film (220, 210).

Regarding claims 50-51, Hung discloses that the cathode comprises a translucent conductive film (lines 9-11 of column 6). Further recitation of process of forming the cathode layer has not been given patentable weight, since process of making device is not germane to the issue of patentability of the device itself.

Regarding claim 54, Hung discloses that cathode comprises Mg-Ag conductive material, which has work function of 3.7 eV.

Regarding claim 58, Hung discloses that the electron transport supporting layer has a film thickness in the range of 10 nm to 1 micron (lines 6-8 of column 6).

Regarding claims 59-60, Hung discloses that the EL element of Fig 2 is a light emitting display (lines 14-16 of column 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-44, 46-48, 52-53, 55-56, 61-68 & 70-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hung (US 6483236) and further in view of Sato et al. (US 6660411).

Regarding claim 1, Hung discloses an EL element (organic light emitting device, Fig 2) comprising an anode (204, lines 1-2 of column 4) an electroluminescent film (210, 220, lines 3-13 of column 4) containing an organic compound capable of generating electroluminescence over the anode; a floating electrode over the EL film (230, lines 14-24 of column 4), an electron transport supporting layer (240) over the floating electrode 230 (lines 25-26 of column 4) and a cathode (250, lines 26-28 of column 4) over the electron transport supporting layer.

But Hung fails to disclose that either electroluminescent film or the electron transport supporting layer contain hole blocking material.

However, in the same field of EL device, Sato et al. teach the use of a phenanthroline derivative such as Bphen ,which is a well known hole blocking material as the electron transport material since this will result an organic EL device with improved efficiency of charge mobility and excellent stability during driving while requires low voltage (41-56 of column 3).

Regarding claims 2-3, Hung discloses that the cathode comprises a translucent conductive film (lines 9-11 of column 6). Further recitation of process of forming the cathode layer has not been given patentable weight, since process of making device. is not germane to the issue of patentability of the device itself.

Regarding claims 4-5 & 7, Sato et al. disclose bathophenanthroline (Bphen) as the hole blocking material, which has ionization potential of 6.5 eV (intrinsic property of Bphen) having higher electron mobility than hole mobility (lines 42-55 of column 3). Same reason for combing art as in claim 1 applies.

Regarding claim 6, Hung discloses that cathode comprises Mg-Ag conductive material, which has work function of 3.7 eV.

Regarding claims 8-9, Hung discloses that the floating electrode (230) comprises an insulating film 232 formed of LiF contacted with the EL layer (220) and a conductive film 234 formed of Al contacted with the electron transporting layer, where lithium has work function less than 3.5 eV.

Regarding claim 10, Hung discloses that the electron transport supporting layer has a film thickness in the range of 10 nm to 1 micron (lines 6-8 of column 6).

Regarding claims 11 & 12, Hung discloses that the EL element of Fig 2 is a light emitting display (lines 14-16 of column 1).

Claim 13 recites the same structure of EL element as in claim 1 except for position of cathode and anode has been exchanged. However, it is well known that some of the OLEDs are bottom-emitting type, where generally transparent anode lies in the bottom while for top emitting device transparent anode lies on the top of the stack. Thus it would have been an obvious choice to one having ordinary skill in the art the time the invention was made to have a top emitting device having anode on the top and cathode on the bottom, in order to obtain a top emitting OLED (TOLED).

Claims 14-24 recite essentially the same limitations of claims 2-12 respectively. Thus claims 14-24 are rejected as claims 2-12 (see rejection of claims 2-12).

Claims 25-36 are rejected as claims 13-24 (see rejection of claims 13-24 respectively).

Regarding claim 37, Hung discloses an EL element (organic light emitting device, Fig 2) comprising an anode (204, lines 1-2 of column 4) an electroluminescent film (210, 220, lines 3-13 of column 4) containing an organic compound capable of generating electroluminescence over the anode; an electron transporting layer (232, made of LiF) over the electroluminescent film (220), a floating electrode (234, lines 14-24 of column 4) over the electron transporting layer 232, an electron transport supporting layer (240) over the floating electrode 234 (lines 25-26 of column 4) and a cathode (250, lines 26-28 of column 4) over the electron transport supporting layer.

But Hung fails to disclose that either electroluminescent film or the electron transport supporting layer contain hole blocking material.

However, in the same field of EL device, Sato et al. teach the use of a phenanthroline derivative such as Bphen, which is a well known hole blocking material as the electron transport material since this will result an organic El device with improved efficiency of charge mobility and excellent stability during driving while requires low voltage (41-56 of column 3).

Regarding claims 38-39, Hung discloses that the cathode comprises a translucent conductive film (lines 9-11 of column 6). Further recitation of process of forming the cathode layer has not been given patentable weight, since process of making device is not germane to the issue of patentability of the device itself.

Regarding claims 40-41 & 43, Sato et al. disclose bathophenanthroline (Bphen) as the hole blocking material, which has ionization potential of 6.5 eV (intrinsic property of Bphen) having higher electron mobility than hole mobility (lines 42-55 of column 3). Same reason for combing art as in claim 37 applies.

Regarding claim 42, Hung discloses that cathode comprises Mg-Ag conductive material, which has work function of 3.7 eV.

Regarding claim 46, Hung discloses that the electron transport supporting layer has a film thickness in the range of 10 nm to 1 micron (lines 6-8 of column 6).

Regarding claims 47 & 48, Hung discloses that the EL element of Fig 2 is a light emitting display (lines 14-16 of column 1).

Regarding claims 52-53 & 55, Hung discloses all the limitations (see rejection of claim 49) but fails to disclose a hole-blocking material.

However, in the same field of EL device, Sato et al. teach the use of a phenanthroline derivative such as Bphen, which is a well known hole blocking material as the electron transport material since this will result an organic El device with improved efficiency of charge mobility and excellent stability during driving while requires low voltage (41-56 of column 3), which has ionization potential of 6.5 eV (intrinsic property of Bphen) having higher electron mobility than hole mobility (lines 42-55 of column 3).

Regarding claim 61, Hung discloses an electroluminescent element an EL element (organic light emitting device, Fig 2) comprising a cathode (250, lines 26-28 of column 4), an electron transport supporting layer (240, lines 25-26 of column 4) over the cathode, a floating electrode (234, made of aluminum) over the electron transport supporting layer, an electron transporting layer (232, made of electron transporting material LiF, lines 14-24 of column 4) over the floating electrode (234), an electroluminescent film (210, 220, lines 3-13 of column 4) containing an organic compound capable of generating electroluminescence over electron transporting layer (232) and an anode (204, lines 1-2 of column 4) over the electroluminescent film (220, 210).

But Hung fails to disclose that either electroluminescent film or the electron transport supporting layer contain hole blocking material.

However, in the same field of EL device, Sato et al. teach the use of a phenanthroline derivative such as Bphen, which is a well known hole blocking material as the electron transport material since this will result an organic El device with improved efficiency of charge mobility and excellent stability during driving while requires low voltage (41-56 of column 3).

Regarding claims 62-63, Hung discloses that the cathode comprises a translucent conductive film (lines 9-11 of column 6). Further recitation of process of forming the cathode layer has not been given patentable weight, since process of making device is not germane to the issue of patentability of the device itself.

Regarding claims 64-65 & 67, Sato et al. disclose bathophenanthroline (Bphen) as the hole blocking material, which has ionization potential of 6.5 eV (intrinsic property of Bphen) having higher electron mobility than hole mobility (lines 42-55 of column 3). Same reason for combing art as in claim 61 applies.

Regarding claim 66, Hung discloses that cathode comprises Mg-Ag conductive material, which has work function of 3.7 eV.

Regarding claims 44, 56 & 68 Hung discloses aluminum as the material for floating electrode and also teaches that floating electrode is provided in order to enhance the injection of electrons into the EL layer. It is well known that the metals having work-function of 3.5 eV or less are suitable for effective electron injection, thus it would have been obvious to one having ordinary skill in the art the time the invention was made to use metals having work function less than 3.5 eV or less as the material

for floating electrode, since selection of known materials for the known purposes are considered to be within the skill of art.

Regarding claim 70, Hung discloses that the electron transport supporting layer has a film thickness in the range of 10 nm to 1 micron (lines 6-8 of column 6).

Regarding claims 71 & 72, Hung discloses that the EL element of Fig 2 is a light emitting display (lines 14-16 of column 1).

Other Prior Art Cited

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure : Adachi et al. (US 6573651); Parthasarathy et al. (US 6885149).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is (571) 272-2452. The examiner can normally be reached on Monday-Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Karabi Guharay

Karabi Guharay
Patent Examiner
Art Unit 2879